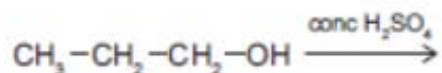


Types of Reactions

1) For each of the following reactions:

- Write the structural formula of the organic product formed.
- State the type of reaction occurring. Choose from the word list: elimination or addition or oxidation or substitution or hydrolysis or halogenation or acid-base

i) Type of reaction:

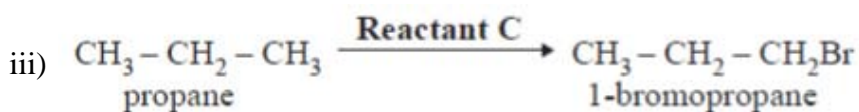
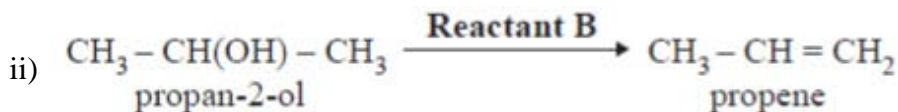
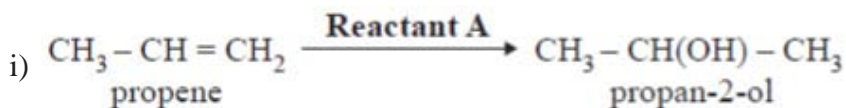


ii) Type of reaction:



2)a) For each of the THREE following reactions:

- Write the name or structural formula of the reactant used.
- State the type of reaction occurring. Choose from acid-base or addition or elimination or hydrolysis or substitution



b) Hydrocarbons can undergo addition and substitution reactions.

Compare and contrast addition and substitution reactions. Use the reactions of ethane, $\text{CH}_3\text{--CH}_3$, and ethene, $\text{CH}_2=\text{CH}_2$, with chlorine as your examples in your answer.

Your answer must also include:

- a description of each type of reaction
- conditions for addition and substitution reactions
- equations showing the structural formulae of the organic reactant(s) and product(s).

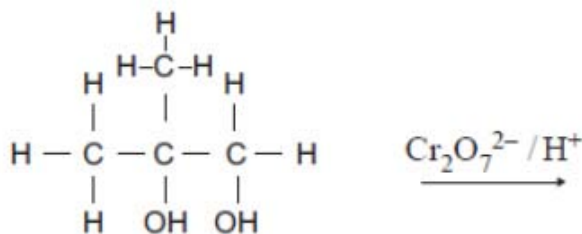
c) Give the structural formula of the organic product formed when:

i) Ethanol, $\text{C}_2\text{H}_5\text{OH}$, reacts with acidified potassium dichromate solution.

ii) Ethanoic acid, CH_3COOH , reacts with sodium carbonate solution.

d) 2-methyl propan-1,2-diol can be oxidised with acidified potassium dichromate, $\text{Cr}_2\text{O}_7^{2-} / \text{H}^+$, to form a compound with molecular formula $\text{C}_4\text{H}_8\text{O}_3$. The compound $\text{C}_4\text{H}_8\text{O}_3$ reacts with sodium carbonate solution to form bubbles of carbon dioxide gas.

i) Draw the **structural formula** of the compound $\text{C}_4\text{H}_8\text{O}_3$ in the box below.

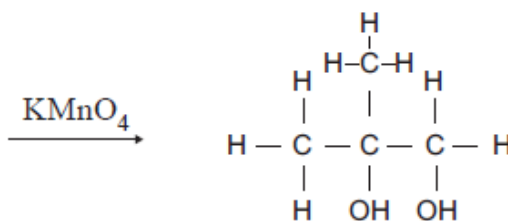


2-methyl propan-1,2-diol

Explain your answer

ii) One of the isomers of C_4H_8 can be oxidised with potassium permanganate, KMnO_4 , to form 2-methyl propan-1,2-diol.

Structural formula:
Molecular formula: C_4H_8



2-methyl propan-1,2-diol